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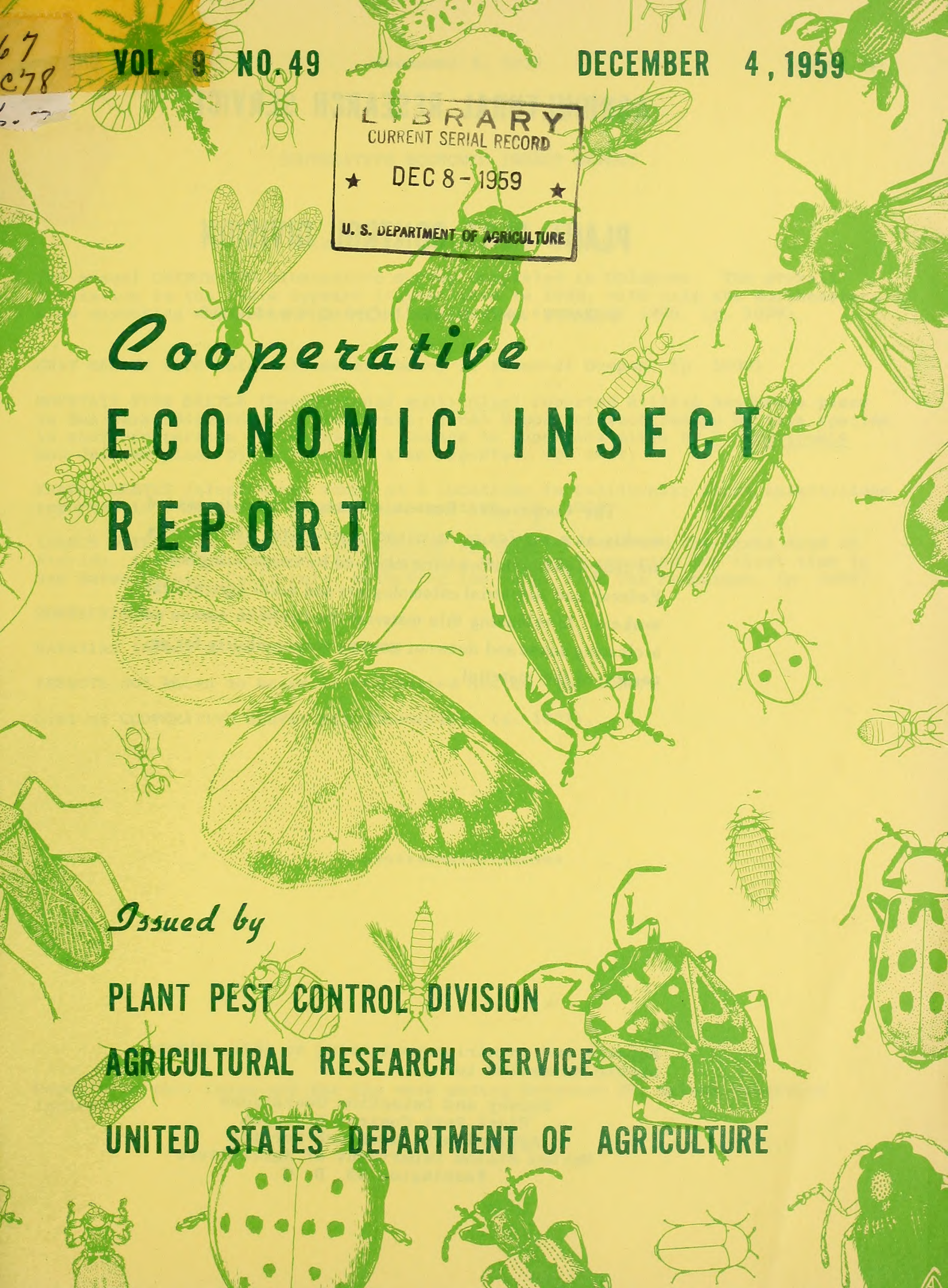

# *Cooperative* ECONOMIC INSECT REPORT

*Issued by*

PLANT PEST CONTROL DIVISION
AGRICULTURAL RESEARCH SERVICE
UNITED STATES DEPARTMENT OF AGRICULTURE

# AGRICULTURAL RESEARCH SERVICE

# PLANT PEST CONTROL DIVISION

## SURVEY AND DETECTION OPERATIONS

The Cooperative Economic Insect Report is issued weekly as a service to American Agriculture. Its contents are compiled from information supplied by cooperating State, Federal, and industrial entomologists and other agricultural workers. In releasing this material the Division serves as a clearing house and does not assume responsibility for accuracy of the material.

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Survey and Detection Operations
Plant Pest Control Division
Agricultural Research Service
United States Department of Agriculture
Washington 25, D. C.

Volume 9 December 4, 1959 Number 49

# COOPERATIVE ECONOMIC INSECT REPORT

## Highlights of Insect Conditions

The annual CHINCH BUG hibernation survey completed in Oklahoma. The overall population in the State appears lighter than in 1958, with only the northeastern area expecting any serious infestations during spring of 1960. (p. 1029).

GRAY GARDEN SLUG infestations are heavy in areas of Oregon. (p. 1030).

MOUNTAIN PINE BEETLE (Dendroctonus monticolae) reported killing ponderosa pines in San Bernardino County, California; first report of such damage by this species in southern portion of the State. Damage to ponderosa pines by D. brevicomis and Jeffrey pines by D. jeffreyi also reported. (p. 1031).

KHAPRA BEETLE infestations found at 3 locations in California; first infestations reported in 8 months of intensive inspection. (p. 1032).

INSECT DETECTION: A scarab (Gronocarus autumnalis) recorded for first time in Florida. (p. 1030). A sod fly (Metoponia rubriceps) reported for first time in San Mateo County, California; extending its range from San Francisco. (p. 1029).

CORRECTIONS. (p. 1033).

HAWAIIAN insect notes. (p. 1034).

INSECTS not known to occur in the United States. (p. 1035).

List of COOPERATIVE SURVEY ENTOMOLOGISTS. (p. 1037).

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Reports in this issue are for the week ending November 27, unless otherwise indicated.

## WEATHER BUREAU 30-DAY OUTLOOK

### DECEMBER 1959

The Weather Bureau's 30-day outlook for December calls for temperatures to average below seasonal normals over the eastern half of the Nation, with greatest departures over states bordering the Ohio and lower Mississippi Valleys. Above normal temperatures are predicted for West Coast and northern Rocky Mountain States. In the remainder of the country near normal temperatures are indicated. Precipitation is expected to exceed normal from the Appalachians eastward and also along the Gulf Coast. Near normal amounts are in prospect for central portions of the country, and subnormal for the western third as well as the Northern Plains. From Virginia northward atmospheric conditions appear favorable for early season snow storms.

Weather forecast given here is based on the official 30-day "Resume and Outlook," published twice a month by the Weather Bureau. You can subscribe through Superintendent of Documents, Washington 25, D. C. Price $4.80 a year, $2.40 a half year.

## WEATHER OF THE WEEK ENDING NOVEMBER 30

Temperatures over the western third of the Nation and along the Atlantic coast from the Carolinas through New England were generally above normal this week. Unseasonable chill covered the Nation's midsection as outbreaks of cold Polar air continued to push southward. Temperatures in the upper Mississippi Valley and the western Great Lakes region have continued below normal for 4 weeks in Illinois and for 9 consecutive weeks in Iowa and Wisconsin. During November in south central Texas, freezing temperatures occurred on 10 days at Austin and on 8 days at San Antonio, and both stations recorded new record low monthly mean temperatures. Generally mild temperatures were prevalent in most areas early in the week, followed by colder readings as Polar air moved across the Great Plains to the Gulf coast and the Southeast by the weekend. Below-zero levels were recorded as far south as Colorado, Nebraska and Iowa, and freezing temperatures and frost extended to the Everglades and Immokalee in south Florida, the Louisiana-Alabama coast, and the lower Rio Grande Valley in Texas. Temperatures along the Atlantic coast reached much-above seasonal levels during part of the week, with 60's recorded as far north as Boston on 4 days. In the Pacific Northwest the 69° reading at Yakima, Washington, on the 23rd set a new record for so late in the season.

Precipitation of consequence was absent in the Western States, being confined to widely scattered light showers or snow in the mountainous areas, except in western Washington where over 1 inch was recorded. In the Great Plains and upper Mississippi Valley precipitation was general, falling as snow from Missouri and the Texas Panhandle northward. Snow totals ranged from near 6 inches in North Dakota to 2-5 inches in Minnesota, up to 3 inches in Oklahoma and 1-2 inches in many other sections. Water totals were generally below 0.50 inch. Rain in the Southern States was generally light, ranging up to 1-2 inches in local areas in Texas and Florida. Rains and snows from the Ohio Valley and the southern Appalachians to New England left some heavy precipitation totals over a wide area. In the Northeastern States precipitation was recorded almost daily. Heavy rain and snow extended from Tennessee and North Carolina northward along the mountains into New York and New England late in the week. Up to 12 inches of new snow was reported along Lake Erie, 5-10 inches in northern New England and the first important fall of the season in southern New England. Rainfall totals ranged from 2 to 5 inches in New England and from 3 to 4 inches in the Adirondacks, Catskills and Poconos. (Summary supplied by U. S. Weather Bureau).

## CEREAL AND FORAGE INSECTS

CHINCH BUG (*Blissus leucopterus*) - OKLAHOMA - The annual hibernation survey was conducted during the period of November 16-23. The results indicate an average county rating of very severe (2,000 or more bugs per square foot) in Craig County only; severe (1,000-2,000 per square foot) in Delaware and Wagoner Counties; moderate (500-1,000 per square foot) in Kay, Lincoln, Rogers and Washington Counties; light (250-500 per square foot) in 10 counties; and noneconomic in 27 counties. Total of 44 counties were surveyed. Compared with the average county ratings in 1958, 8 counties increased in rating, 10 counties remained constant and 26 counties dropped in average ratings. With the exception of Lincoln and Kay Counties, only the northeastern area had any counties with an average county rating of moderate or above. The overall trend for the State appears to be lighter again in 1959, with only the northeastern area expecting any severe or very severe infestations during the spring of 1960. Damaging infestations may occur in isolated localities, however, in the central and north central areas. (PPC, State Dept. of Agr., Okla. State Univ. (cooperating)).

A PLANTHOPPER (*Sogata orizicola*) - ARKANSAS - Surveys of 112 rice fields during October were negative. Other species of *Sogata* taken were *S. furcifera* (4 males) and *Sogata* sp., probably *furcifera* (15 males). (Ark. Ins. Rpt.).

GREENBUG (*Toxoptera graminum*) - OKLAHOMA - Found in very limited numbers in a few fields of small grain in Stillwater area. (Wood). Infestations continued very light, with little or no increase in populations noted in Hennessey area. (Owens). Populations continued light (4.7 per linear foot) with little or no increase over previous week in 4 fields of small grain checked in Marshall and Love Counties. (Vinson). None noted in field checked in Jackson County (Presgrove) and in 3 fields checked in Washita County (Hudson). TEXAS - Counts ranged 0-1 per linear foot in wheat in Hansford County in the panhandle.(Daniels).

APPLE GRAIN APHID (*Rhopalosiphum fitchii*) - OKLAHOMA - Present in very light numbers in 4 wheat fields checked in Hennessey-Bison area. (Owens). Averaged 1.5 per linear foot in 2 of 4 fields of small grain checked in Marshall and Love Counties. (Vinson). None noted in 4 fields checked in Jackson and Washita Counties. (Presgrove, Hudson).

CORN LEAF APHID (*Rhopalosiphum maidis*) - OKLAHOMA - Counts averaged 4.6 per linear foot in 4 fields of small grain checked in Marshall and Love Counties. (Vinson).

ENGLISH GRAIN APHID (*Macrosiphum granarium*) - DELAWARE - Common in large field of winter rye in Kent County. (Burbutis, Mason).

*Sticky Board Aphid Collections in Arizona, November 16-23* - Collections per trap of rusty plum aphid (*Hysteroneura setariae*) and corn leaf aphid (*Rhopalosiphum maidis*) at several locations are as follows: *H. setariae* - Mesa, 21; Kyrene, 23; Waddell, 110; Glendale, 705; Deer Valley, 41. *R. maidis* - Mesa, 1; Kyrene, 2; Waddell, 7; Glendale, 12; Deer Valley, 4. (Ariz. Coop. Sur.).

WINTER GRAIN MITE (*Penthaleus major*) - TEXAS - Heavy infestation damaged 5 acres of young oats in Rockwall County. (Davis).

DATE MITE (*Oligonychus pratensis*) - OKLAHOMA - Caused appreciable browning of Bermuda grass in Altus area during October. Det. E. W. Baker. (Hatfield).

GRASSHOPPERS - UTAH - Eggs numerous in some Box Elder County dryfarm areas and soilbank lands. (Thornley, Knowlton).

A SOD FLY (*Metoponia rubriceps*) - CALIFORNIA - Light in sod in a golf course in Daly City, San Mateo County. The species has extended its range in San Francisco, where it is known to occur. This is the first record for San Mateo County. (Cal. Coop. Rpt.).

A SCARAB (Gronocarus autumnalis) - FLORIDA - An adult collected on St. Augustine grass at Panama City, Bay County, on November 11. (Hollister). This is a very rare species. These specimens represent the first record for Florida. The female is wingless and therefore spends its life in the soil. (Fla. Coop. Sur.).

SPOTTED ALFALFA APHID (Therioaphis maculata) - OREGON - Still present in Hermiston area on November 23, after a period with temperatures reaching zero and sub-zero levels. (Bierman). OKLAHOMA - Counts ranged 10-25 per square foot in an alfalfa field in Washita County. (Hudson).

PEA APHID (Macrosiphum pisi) - ARIZONA - Light infestations in central and southeastern area alfalfa. (Ariz. Coop. Sur.). DELAWARE - Present on alfalfa throughout the State. (Burbutis, Mason).

LYGUS BUGS (Lygus spp.) - ARIZONA - Infestations in 12-inch alfalfa averaged 17 per 10 sweeps in 10 fields in Maricopa County. (Ariz. Coop. Sur.).

TARNISHED PLANT BUG (Lygus lineolaris) - LOUISIANA - Totaled 126 per 100 sweeps in alfalfa in Bossier Parish. (Spink). DELAWARE - Adults fairly common in alfalfa throughout the State. (Burbutis, Mason).

THREE-CORNERED ALFALFA HOPPER (Spissistilus festinus) - LOUISIANA - Totaled 24 per 100 sweeps in alfalfa in Bossier Parish. (Spink).

POTATO LEAFHOPPER (Empoasca fabae) - DELAWARE - Adults fairly common in Kent and Sussex Counties and present in New Castle County on alfalfa. (Burbutis, Mason).

CLOVER LEAFHOPPER (Aceratagallia sanguinolenta) - DELAWARE - Adults numerous on alfalfa in Kent and Sussex Counties. (Burbutis, Mason).

A THRIPS (Frankliniella occidentalis) - ARIZONA - Heavy infestations in central and southwestern area alfalfa. (Ariz. Coop. Sur.).

SPOTTED CUCUMBER BEETLE (Diabrotica undecimpunctata howardi) - LOUISIANA - Totaled 194 per 100 sweeps in alfalfa in Bossier Parish. (Spink). DELAWARE - Adults common in Kent and Sussex Counties and present in New Castle County in alfalfa. Adults also present on cover crop in Kent County. (Burbutis, Mason).

ALFALFA WEEVIL (Hypera postica) - DELAWARE - Adults present in Sussex County and common in Kent County alfalfa. (Burbutis, Mason).

GRAY GARDEN SLUG (Deroceras reticulatum) - OREGON - Severely damaging fall-sown seedling plants of crimson clover and hairy vetch in Washington County.Observations made from October 25 to November 12. In large areas of an 80-acre hairy vetch field, plants were almost entirely destroyed; also, 100 feet of border of a crimson clover field had to be plowed up. Damage by slugs continues high in Willamette Valley. (Prescott, Nov. 20).

## FRUIT INSECTS

WALNUT HUSK FLY (Rhagoletis completa) - CALIFORNIA - Adult taken in a Frick trap for the first time in Lan Luis Obispo, San Luis Obispo County. (Cal. Coop. Rpt.).

HICKORY SHUCKWORM (Laspeyresia caryana) - OKLAHOMA - Counts averaged 1.5 per nut in grove of native pecans in Marshall County (Vinson) and 2-3 per nut in Payne County (Howell).

PECAN WEEVIL (Curculio caryae) - OKLAHOMA - Counts averaged 0.2 larva per nut in a grove of native pecans in Marshall County. (Vinson).

RED-BANDED THRIPS (Selenothrips rubrocinctus) - FLORIDA - All stages reported on mango at Goulds, Dade County. Approximately one percent of nursery stock reported to be losing leaves. Similar infestation not seen for at least 4 to 6 years. Det. D. O. Wolfenbarger. (Fla. Coop. Sur., Nov. 20).

## TRUCK CROP INSECTS

MELONWORM (Diaphania hyalinata) - CALIFORNIA - Two additional larvae taken from wild gourds in Bard Valley, Imperial County, at different locations. (Cal. Coop. Rpt.).

SEED-CORN MAGGOT (Hylemya cilicrura) - CALIFORNIA - Heavy infestation in onions in Durham, Butte County. (Cal. Coop. Rpt.).

TARNISHED PLANT BUG (Lygus lineolaris) - DELAWARE - Adults present on turnips in New Castle and Sussex Counties and present on spinach in Sussex County. (Burbutis, Mason).

GREEN PEACH APHID (Myzus persicae) - DELAWARE - Numerous on turnips in New Castle County, causing light feeding injury to the leaves. (Burbutis, Mason).

TURNIP APHID (Rhopalosiphum pseudobrassicae) - DELAWARE - Apterous forms fairly common on turnips in Sussex County. (Burbutis, Mason).

POTATO APHID (Macrosiphum solanifolii) - DELAWARE - Apterous forms present in large commercial planting of spinach in Sussex County. (Burbutis, Mason).

## FOREST, ORNAMENTAL AND SHADE TREE INSECTS

BARK BEETLES (Dendroctonus spp.) - CALIFORNIA - D. brevicomis and D. monticolae killing pole-size ponderosa pines in Lake Gregory area, San Bernardino County. D. monticolae is a frequent killer of pole-size stands in northern areas of the State, but this is first report of such from southern portion of the State. Drought and disease are probably contributing factors. Groups now being treated under a control program. (W. Swearingen, C. B. Eaton). D. jeffreyi causing complete kill and some top kill of Jeffrey pines in Big Bear Valley and Holcomb Creek areas, San Bernardino County, in groups up to 18 trees in a large area. Outbreak is above normal in a sanitation-salvage area and is believed due to lightning-struck trees coupled with drought. (J. B. Pierce).

A PINE SAWFLY (Neodiprion excitans) - FLORIDA - Eggs and larvae (second and third instars) reported on pond pine (Pinus serotina) in Alachua County. Det. L. A. Hetrick. (Fla.Coop. Sur.).

FALL CANKERWORM (Alsophila pometaria) - INDIANA - First emergence observed November 22 in Lafayette area, with silver maple principal host. (Chandler).

LEAFHOPPERS - CALIFORNIA - A medium infestation of Empoasca neaspersa and Circulifer tenellus occurring in Jacalitos Canyon, Fresno County, on Lepidospartum squamatum. (Cal. Coop. Rpt.).

A TULIP BULB APHID (Anuraphis sp.) - CALIFORNIA - Medium infestation on tulip bulbs in Redwood City, San Mateo County. (Cal. Coop.Rpt.).

A LATANIA SCALE (Aspidiotus lataniae) - CALIFORNIA - Heavy infestation of palms occurring in San Ysidro, San Diego County. (Cal. Coop. Rpt.).

## INSECTS AFFECTING MAN AND ANIMALS

MOSQUITOES - CALIFORNIA - Populations increased along the Sacramento River. Unseasonably warm weather brought out hibernating females to annoy residents. (Cal. Coop. Rpt.). UTAH - Mosquitoes have generally disappeared from the fields. Some *Anopheles freeborni* found in homes in northern part of State. (Knowlton).

COMMON CATTLE GRUB (*Hypoderma lineatum*) - OKLAHOMA - Averaged 3 per animal on 17 yearling steers in the Oakland area and 0-3 per animal on 84 head of cattle in the Madill area, both in Marshall County. Eighty percent of the Oakland group were infested while only 30 percent of the Madill group had grubs. (Vinson).

CATTLE LICE - OKLAHOMA - One bull found infested in a cattle herd checked in the Madill area, Marshall County. (Vinson). WYOMING - *Linognathus vituli* heavy on calves at Laramie, Albany County. (Davison).

FLEAS - MARYLAND - Unspecified species troublesome in homes at localities in Allegany and Montgomery Counties. (U. Md., Ent. Dept.).

TICKS - OKLAHOMA - Bobwhite quail in Blaine and Major Counties heavily infested with *Haemaphysalis leporis-palustris*; over 300 taken from one bird. (Steele). WYOMING - *Otobius* sp. present on cattle at Wheatland, Platte County. (Davison).

## STORED-PRODUCT INSECTS

KHAPRA BEETLE (*Trogoderma granarium*) - CALIFORNIA - Medium in bins and salt sacks in a mill in Brawley, Imperial County; medium on salt sacks in a mill in San Diego and in a storage building in Borrego, San Diego County. Believed to have been brought in on a salt shipment from outside the State. These are first infestations in 8 months of intensive inspection. (Cal. Coop.Rpt.).

LESSER GRAIN BORER (*Rhyzopertha dominica*) - OREGON - Heavy in grain storage facilities in eastern Malheur County, November 18. A mixed culture of other major grain pests also present, but this species by far the predominant one. (Wallin).

CONFUSED FLOUR BEETLE (*Tribolium confusum*) - SOUTH DAKOTA - Infesting a home in Brookings, Brookings County. (Mast).

## BENEFICIAL INSECTS

CONVERGENT LADY BEETLE (*Hippodamia convergens*) - ARIZONA - Infestations, primarily this species, average 5-10 per 10 sweeps in alfalfa statewide. (Ariz. Coop. Sur.). OKLAHOMA - Counts ranged 0.1-1.0 per linear foot in 3 of 4 fields of small grain checked in Marshall and Love Counties. (Vinson).

NABIDS (*Nabis* spp.) - ARIZONA - Counts average 2-6 per 10 sweeps in alfalfa in central area of State. (Ariz. Coop. Sur.). OKLAHOMA - Averaged 0.2 per linear foot in one of 4 fields of small grain checked in Marshall and Love Counties. (Vinson).

## MISCELLANEOUS INSECTS

AN OTITID (*Chrysomyza demandata*) - SOUTH DAKOTA - A heavy infestation of larvae found in silage in Hughes County. (Hantsbarger).

A CHERMID - TEXAS - An unknown species annoying residents in the College Station and Bryan areas, Brazos County. (Hawkins).

AN EARWIG (*Forficula* sp.) - GEORGIA - Numerous infestations in Richmond, Putnam, Wilcox and Decatur Counties; infesting homes and annoying residents. (Johnson).

## CORRECTIONS

CEIR 9(46):997 - PAINTED MAPLE APHID (Drepanaphis acerifolii) should read (Drepanaphis acerifoli*ae*). Delete correction in CEIR 9(47):1010.

CEIR 9(48):1021 - All notes under BARK BEETLES for VIRGINIA refer to *Ips* spp. rather than *Dendroctonus* spp. (PPC). In spite of a recent special survey, *Dendroctonus* spp. have not been found active to date in Virginia this year. (C. L. Morris).

## LIGHT TRAP COLLECTIONS

| | Pseud. | Feltia | Laphygma | | Agrot. | Perid. | Prod. | Helio. |
|---|---|---|---|---|---|---|---|---|
| | unip. | subterr. | frug. | exigua | yps. | marg. | ornith. | zea |
| ARIZONA | | | | | | | | |
| Mesa 11/16-22 | | | | 377 | | 22 | 587 | 4 |
| FLORIDA | | | | | | | | |
| Gainesville 11/25 | | | | | | | 3 | |
| LOUISIANA | | | | | | | | |
| Baton Rouge 11/20-25 | 9 | 3 | 6 | 1 | 2 | | 7 | 1 |
| Franklin 11/23 | | | 5 | | 3 | | 3 | 1 |
| SOUTH CAROLINA | | | | | | | | |
| Charleston 11/23-29 | 8 | 12 | 2 | | 9 | | 4 | 4 |
| Clemson 11/21-27 | 8 | 1 | | | 5 | | | 1 |

## HAWAIIAN INSECT NOTES

Numerous complaints being received concerning large numbers of CRICKETS entering homes at Ewa, Oahu, and doing considerable damage by chewing holes in clothing. An ANT (Anoplolepis longipes) has become established in Makiki in the vicinity of Roosevelt High School. A BEETLE (Lasconotus sp.) was collected for the first time in Hawaii at Hickam Air Force Base, Waipio, and Honolulu. Specimens were determined by Mr. Ford by comparison with specimens from Guam determined by R. H. Arnett. A second specimen of a CICADELLID (Acinopterus angulatus), previously reported in Hawaii in 1959, was collected at Hickam Air Force Base in a black light trap, August 1959. During September 1959, large numbers of adults and nymphs of a LYGAEID (Graptostethus manillensis) were observed on hairy morning-glory, Merremia aegyptia, which was growing on a fence on the southern slope of Diamond Head, Honolulu. The bugs were mostly concentrated on well-developed to mature seed capsules. Adults were piercing the capsules and feeding on the immature seeds. Frequently, from 4 to 6 adults were seen feeding on a single capsule. Newly hatched nymphs found feeding within capsules which had matured sufficiently to crack open slightly. Examination of many mature capsules disclosed a large destruction of their contained seeds, which were collapsed and decaying. No eggs were found in or on the capsules, or elsewhere on the plants though the presence of many nymphs in all stages of development clearly indicated that the bug was actually breeding on this plant. This insect was first collected in Hawaii in a windtrap at Kunia, Oahu, July 21, 1942. From time to time, this bug has been reported on various plants; but in only one case have nymphs been previously observed together with adults, on any plant in Hawaii. Merremia tuberosa was the host in that instance. G. manillensis has been recorded in Sumatra, Java, Philippine Islands, Australia, Hawaii, southern Marianas and the western Carolina Islands.

A MARSH FLY (Sepedon macropus) was recovered and found established at Waiahole, Windward Oahu. On September 23, while installing traps at Waiahole, Oahu, for the recovery of S. macropus, numerous egg rafts were observed on the dorsal leaf surfaces of Monochoria vaginalis and other aquatic plants growing around the perimeter of a taro patch. In addition, 7 flies were observed on taro, Colocasia esculenta, stems and one third-instar larva and one pupa noted in shallow water. In the course of an hour, a crushed liverfluke snail (Fossaria ollula), placed in an invaginated McPhail glass trap, attracted 6 adults. On the following day, 16 adults were trapped within an hour in another taro patch and 4 adults were observed on taro stems and 6 larvae and 6 pupae in shallow water. One third-instar larva was actively feeding on a mature liverfluke snail. This is the first recovery and establishment of S. macropus on Oahu since the initial release of this snail predator on December 5, 1958, and together with an earlier recovery on Kauai, marks the first successful attempt to establish an introduced aquatic snail predator in Hawaii. The first release at Waiahole was made on January 6, 1959, and the last release on July 6, 1959. The possibility of establishment on all major islands appears very promising. (Hawaiian Entomological Society, October 12 meeting).

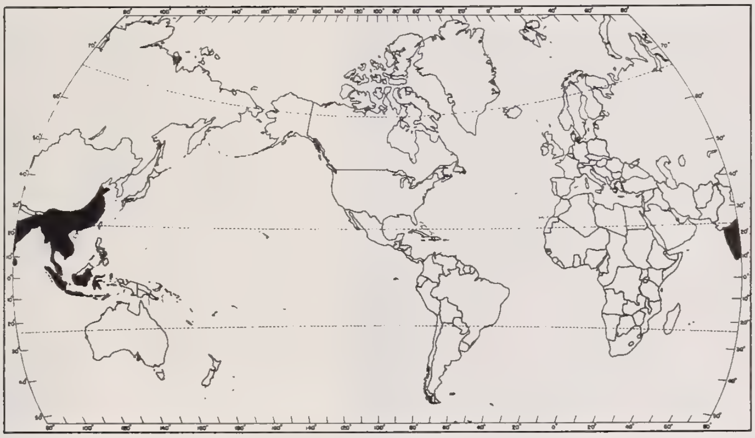
## INSECTS NOT KNOWN TO OCCUR IN THE UNITED STATES

### RICE STEM GALL MIDGE (*Pachydiplosis oryzae* (Wood-Mason))

Economic Importance: This gall-forming insect causes considerable losses to rice in various areas of Asia. Total damage may amount to 75 percent or more in India and losses of 50-100 percent have been reported in Indochina. When both the mother culm and primary tillers of the rice plant are attacked, loss in grain is greater than 60 percent; however, losses may differ considerably in various varieties of rice even if the incidence of infestation is the same. Characteristic damage to rice is evidenced by the forming of a long tube or gall with a green tip, known as "silver shoot" or "onion-shoot," in place of the main stem. As a result of this gall, apical growth of the plant ceases.

Distribution: Occurs throughout most of India, East Pakistan, Burma, Ceylon, Thailand, Indochina, Indonesia and southern China. In addition, specimens which appear to be this species have been determined by H. F. Barnes from the French Sudan and the Sudan.

Hosts: Rice (*Oryza sativa*) is the principal host, both upland and irrigated varieties. Some other grasses, generally species of *Panicum* or *Paspalum*, have been recorded or doubtfully suggested as host plants, but as far as known there has been little, if any, biological experimentation with these hosts.



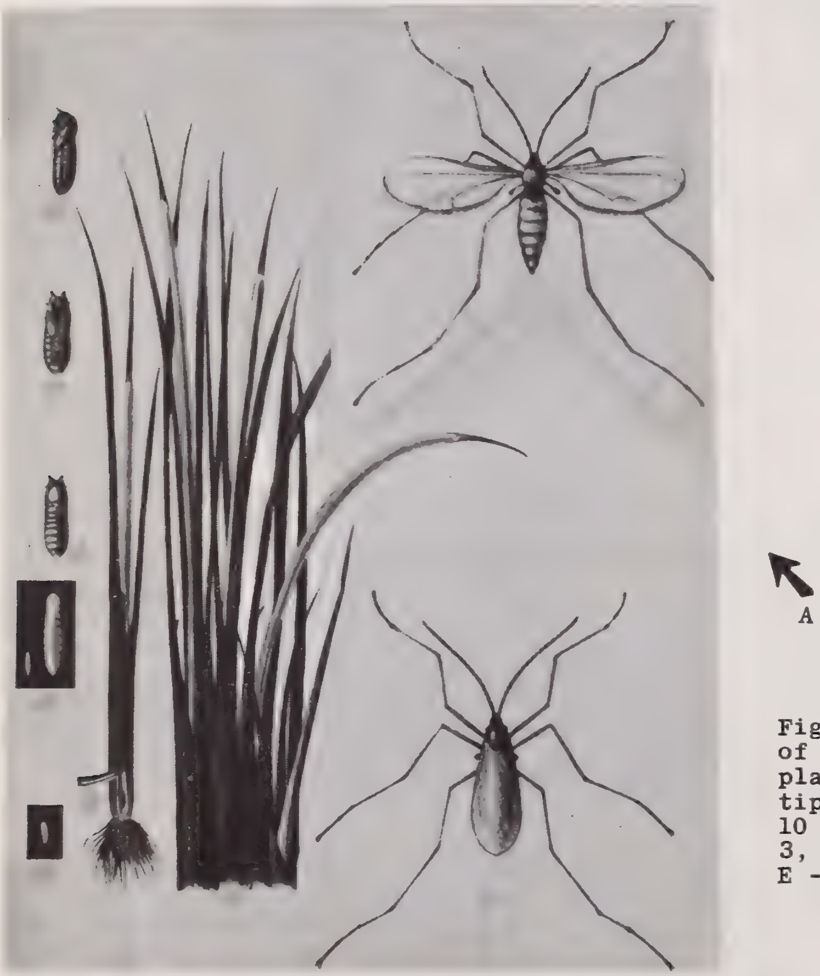
General Distribution of *Pachydiplosis oryzae*

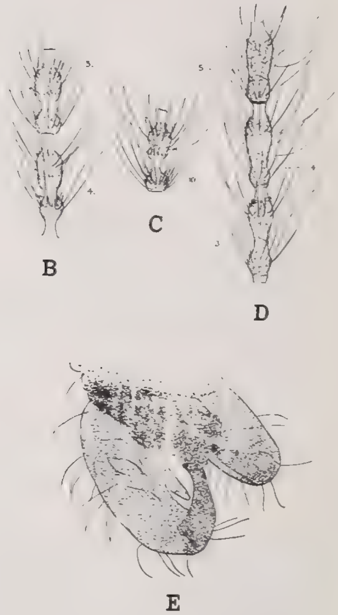
Life History and Habits: Details of the biology as recorded in southern China by Yen, Liu and Kuo are as follows: There are 5 generations a year. Overwintering takes place in the larval stage within the rice stubble. Midges are first seen during late March and are most numerous in early August. The egg, larval and pupal stages last for 3-4, 14-28 and 4-5 days, respectively, between July and October. Females lay about 131 eggs each, with a maximum of 285. Midges are nocturnal, living for 1-3 days. Eggs are laid singly, or in groups, on the leaves. Newly-hatched larvae will survive immersion in water for 2-5 days. Larvae usually pupate by the time the tubular gall is noted.

Additional observations of the life history from other sources are as follows: The young larvae migrate down the plant until they reach the central shoot of the apical or side buds. As a result of feeding on the growing tip, the gall is formed from the leaf-sheaths which grow like an empty tube, carrying with it the blade, auricles and ligule. After emergence of the midge, the empty gall loses turgidity, becomes discolored and falls off. A single larva lives in each gall. Pupation occurs in the gall. The pupa works its way up the tube and emergence takes place. The empty pupal case is left protruding from the exit hole.

(Cecidomyiidae, Diptera)

Description: The ADULTS, as described by M. S. Mani, are as follows: Male - Body yellowish-brown, sparsely haired. Length 3 mm. Antennae dark reddish-brown, thickly haired, nearly equal in length to body, segments 14 (see illustrations); palpi quadriarticulate, short, sparsely setose. Mesonotum brown, submedian lines sparsely haired. Scutellum dirty yellowish-brown, post-scutellum darker. Halter stem light yellowish, head grayish-brown. Legs densely hairy and dark brown. Claws simple on all legs, evenly and slightly curved. Abdomen brownish-yellow, sparsely setose. Genitalia pale-brown, somewhat thickly setose (see illustration). Female - Body bright reddish-brown, thickly haired. Length 3.5 mm. Antennae dark brown, moderately thickly haired, about half length of body, segments 14 (see illustration); palpi quadriarticulate, sparsely setose. Mesonotum dull reddish-brown at sides and brownish-black between submedian lines, which are thickly haired. Scutellum reddish-brown, post-scutellum dark reddish-brown. Legs brownish and sparsely setose. Claws simple on all legs, diverging and somewhat curved at very tip only. Abdomen bright reddish-brown in older specimens, moderately setose. Ovipositor short, conical, terminal lobes of lamellae with length 2½ times its greatest width, sparsely setose. (Prepared in Survey and Detection Operations in cooperation with other ARS agencies). CEIR 9(49):12-4-59.





Figures of P. oryzae: A - Stages of P. oryzae and damage to rice plant (note long galls with silver tips). B & C - Segments 4, 5 and 10 of male antenna. D - Segments 3, 4 and 5 of female antenna. E - Genitalia of male.

Figures (except map): All stages and damage from Fletcher, T. B. (Editor). 1917. Report of the Proceedings, Second Entomological Meeting, Pusa, India, Feb. 5-12, 340 pp. Antennal segments and male genitalia from Mani, M. S. 1934. Records Indian Mus. 36(4):371-452. Major reference: Barnes, H. F. 1956. Gall Midges of Economic Importance. Vol. VII. Gall Midges of Cereal Crops. pp. 204-210, London.

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Revised December 1, 1959

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